

# MC

May, 1958  
*the Manufacturing Confectioner*

V.38 #5-



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candy customers  
can break the**

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*Essential Oils*

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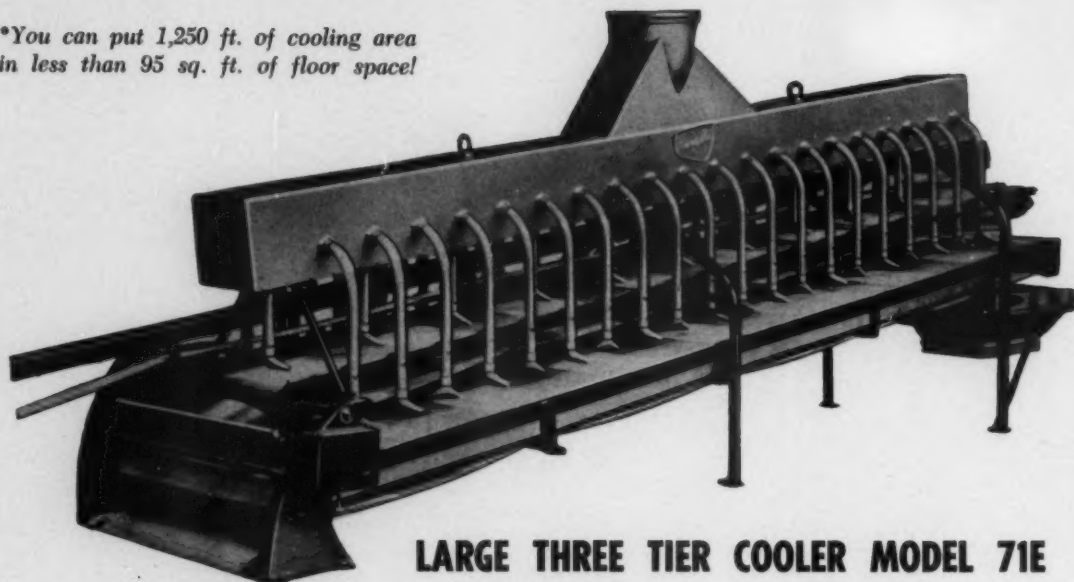
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# candy business

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## Pat Cosler chosen Stroud Jordan Award winner

H. B. "Pat" Cosler, with the Food and Container Institute of the Quartermaster Corp., has been chosen to receive the 1958 Stroud Jordan Medal by the American Association of Candy Technologists. The award will be presented at the AACT annual meeting in San Francisco, July 7.

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## Seaton retires, Fanny Farmer names Curtin and Goolden

William Seaton, vice president of Fanny Farmer, retired May first. Seaton was New England manager and superintendent of the firm's factory there. The day before his retirement, 200 employees gave him a surprise party.

Jack Curtin is the new New England manager, and John Goolden is the new superintendent.

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## Zwelling to VP at Stevens

Karl Zwelling has been appointed vice president of Stevens Candy Kitchens, Inc. with full responsibility for all Mrs. Stevens leased candy departments. Zwelling managed a candy department at the Higbee Company in Cleveland for seven years and has served as chairman of the Candy Steering Committee for the AMC group of department stores.

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## Mitchell named SPM at Kraft

George Mitchell has been named Product Sales Promotion Manager for the Confections Division of Kraft Foods for the firms' caramel and fudge products. Mitchell has been with Kraft for four years and was most recently in the firms' Sales Promotion Division as a staff function.

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## Mortimer J. Adler NCA speaker

Mr. Mortimer J. Adler, philosopher, author, teacher, and Director of the Institute for Philosophical Research in San Francisco, will be the featured luncheon speaker, Tuesday, July 8, at the Diamond Jubilee Convention of the National Confectioners' Association in San Francisco.

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## Cocoa bean consumption down

United States consumption of cocoa beans in the first quarter of this year is down 6.7 percent from a like period of 1957. This decline followed a .8 percent drop in the last quarter of '57 and marks a continuation of a downward trend in demand resulting from increased prices for cocoa beans on the world market since mid-year, 1957.

Figures from the United States Department of Commerce indicates 125.2 million pounds of cocoa beans ground during the first quarter of 1958 compared to 134.2 million pounds the first quarter of 1957.

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## Stevens mfgs for Mary Lee

Mary Lee Candies, of Norwalk, Ohio, who sold their manufacturing facilities to Fanny Farmer, is buying their candy, packaged, from Mrs. Stevens factory in Chicago.

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## Breaker to expand capacity

Breaker Confections, Inc. is planning expansion of their manufacturing plant. Matt Breaker has announced that he will either build a new building or buy one within the next year. This move will give the firm twice its present production capacity.

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## Boston AACT meeting

The Boston Section of the American Association of Candy Technologists will feature a panel discussion on general candy manufacturing at their meeting Tuesday, May 13. This meeting is expected to be one of the most interesting of the season and will be the last meeting until fall.

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## Price leases in Globe, Scranton

Price Candy Company has opened a leased candy department at the Globe Department Store in Scranton, Pennsylvania.

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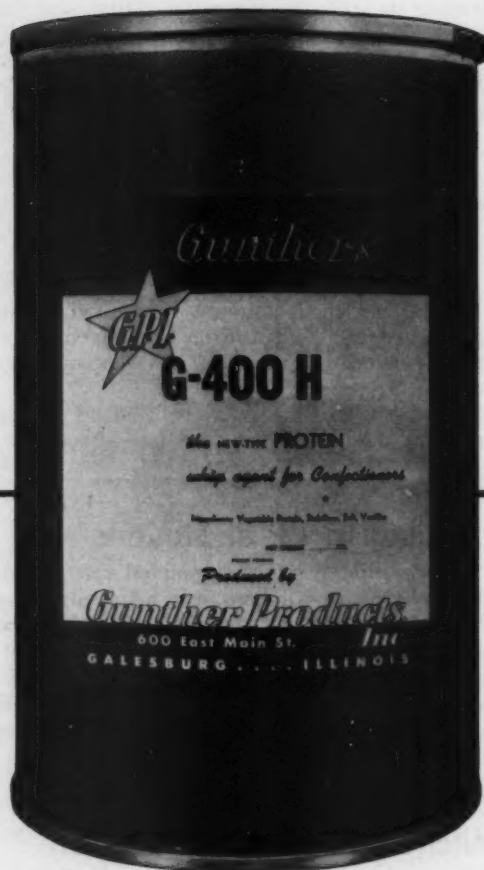
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## Schrafft names officers

W. F. Schrafft & Sons has named I. J. Silverman, Boston Attorney, to the recently created position of chairman of the executive committee. In addition, Edgar H. Savage and Samuel Sidd have been named vice presidents. Both have been with the firm for over fifty years, Savage as purchasing agent, and Sidd as director of plans and production.

## NCA moves offices

The National Confectioners Association has moved their offices to 36 South Wabash Ave., Chicago 3, Illinois. Their telephone number remains Franklin 2-1492.

## February candy sales strong

Candy sales continued strong through the month of February, registering a seven percent increase over February, 1957. This industry increase represented an eight percent increase for manufacturer-wholesalers and a nine percent increase for manufacturer-retailers. Chocolate manufacturers, however, are down three percent for the month and five percent for the first two months of this year.

At least a portion of this increase for February is undoubtedly due to Easter which came about two weeks earlier than last year.

## Chicago AACT meeting

The Chicago section of the AACT will hear Malcolm Forbes of Merrill, Lynch, Pierce, Fenner and Smith talk on the commodity markets. The meeting will be held May 20th at the Graemere Hotel, Chicago at 6:30 P.M.

## NEWSMAKERS

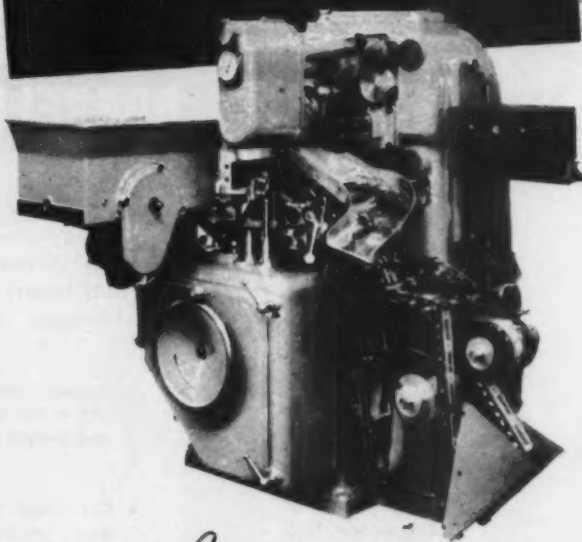
Supermatic Packaging Corporation has announced the appointment of Benedict Marfuggi as vice president in charge of sales. He was formerly associated with Marex Manufacturing Company. This firm recently moved to new offices and show room at 1460 Chestnut Avenue, Hillside, New Jersey.

Irving L. Cook has been named director of sales of E. F. Drew & Co., Inc. Cook was formerly vice president of Rockwood & Company. He will assume responsibility for general sales administration and planning for all divisions of Drew.

Thomas F. Corrigan has been appointed general manager of the new bulk and institutional division of The Nestle Company. This move consolidates bulk and institutional sales at the company. Robert H. Wilson has been appointed assistant manager-bulk sales.

# Look at the performance of this twist-wrapper!

Single end twist wrap	up to 250 per minute
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Double end twist wrap	up to 350 per minute
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Pointed wrap and heat seal	up to 250 per minute



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Hundreds of today's best sellers benefit from Burrells complete line of conveyor belts and specialties for every phase of candy production.

- |                  |                         |                      |
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8 — The Manufacturing Confectioner



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for May 1958 - 9

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Once these users of our products have become fully acquainted with the quality, availability and economic advantages that will be theirs under conditions now prevailing in this area, we are confident a large and continuing demand will develop for these services.

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Very truly yours,  
FRITZSCHE BROTHERS, INC.

*John E. Casullo*  
John E. Casullo,  
President.



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# the Manufacturing Confectioner

with International Confectioner

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May 1958

Volume XXXVIII—Number 5

Edited and Published in Chicago

The Candy Manufacturing Center of the World



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#### Report on research

This is the annual report to the industry of the projects and progress of the PMCA work done on basic research on candy and chocolate.

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#### Odor detection and correction

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## CONFECTIONERY ANALYSIS and COMPOSITION

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Stroud Jordan, M.S., Ph.D.

and

Katheryn E. Langwill, M.S., Ph.D.

This volume, first published in 1946, is still the only published reference work on the subject of confectionery analysis. The pioneering work done by Dr. Jordan remains the standard in the field, making a second printing of his book necessary. This printing is in all respects identical to the first printing.

In assembling this volume reference is made to applicable methods. Where satisfactory methods of analysis are of general knowledge they are incorporated by reference. All specially developed methods and procedures are incorporated in detail.

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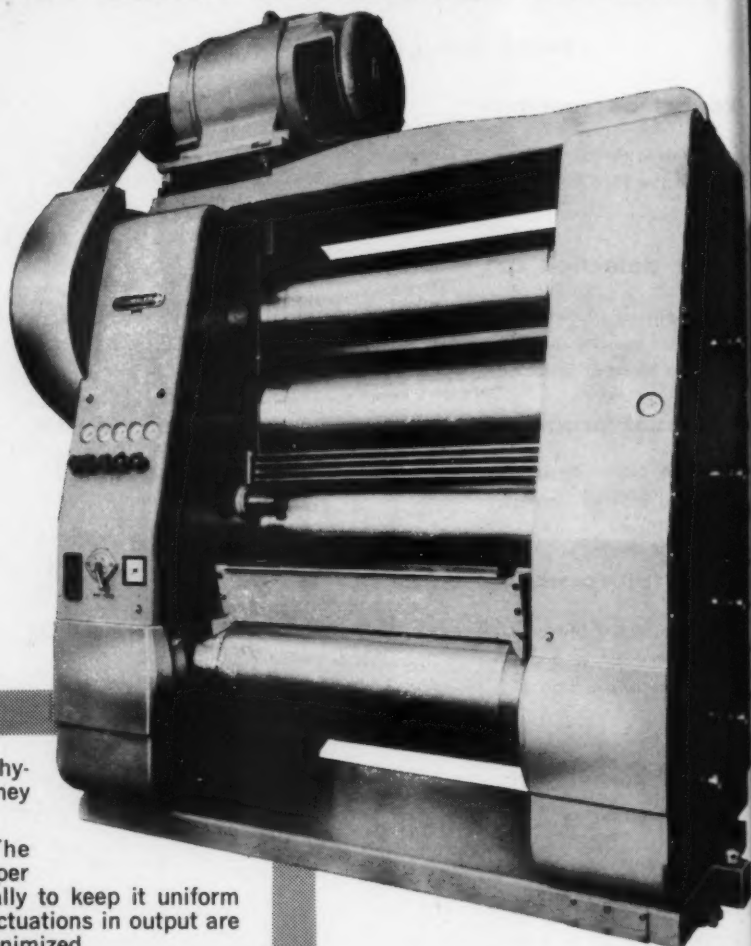
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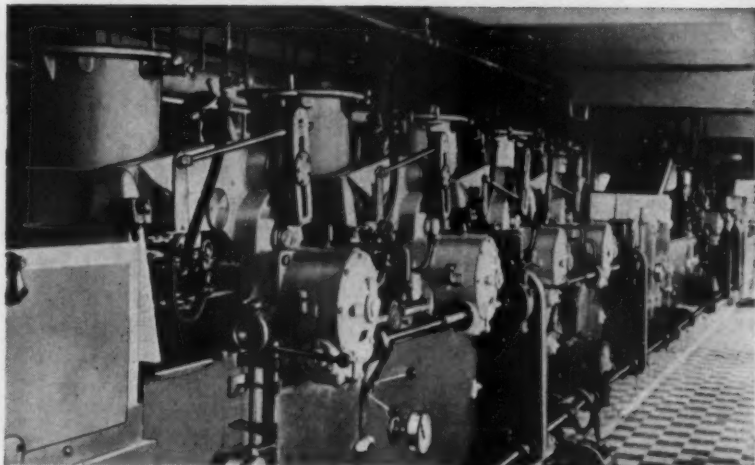
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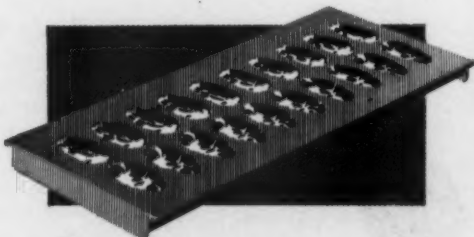
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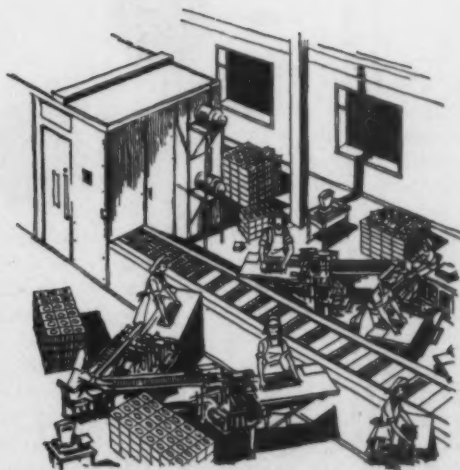
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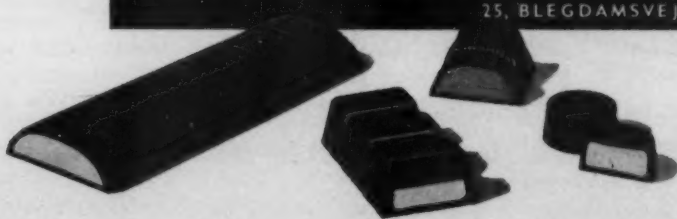
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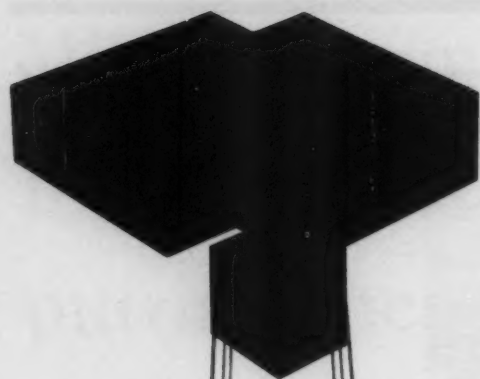
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## Report on PMCA research

by JAY C. MUSSEY, chairman  
PMCA research committee

**F**ollowing with the basic policy of the past, this report will outline the work done by the Research group of PMCA during the past year. During this time, the Research group's efforts have been directed into the following four general areas.

1. A study of the crystallization of cocoa butter.
2. A study of the consistency of the sugar-protein types of confectionery.
3. Continued research into the vapor pressure relationships of candy.
4. The Abstract Service.

The first of these areas, the study on the rate of crystalization of cocoa butter and other factors involved in the tempering of chocolate will be the subject matter of a detailed report given in the next paper on this program by Mr. William Duck, the Research Chemist in charge of the project. For this reason, I shall not go into any further discussion in connection with this particular project.

The second project is a continuing study in connection with the measurements of consistency or chewability of the protein-sugar types of candy such as marshmallow, nougat and caramel. The initial phases of this work have been involved largely with the development of a suitable instrument which is capable of objectively measuring the characteristics which we normally associate with texture and chewing factors. The instrument which has been in use for approximately one year

has yielded much information in connection with the so-called tenderness of various types of confections. More recently, this research has been followed, in addition to the instruments studies, by evaluation of the theoretical viscosity by mathematical methods. The results of this fundamental research appear to offer great promise in helping us to attain a basic understanding of the causes of the variations in the consistency and the eating qualities of these candies. Some work has been done in the correlation of these eating qualities with variations in raw materials, formulation and changes in methods of cooking.

The third area of study and research is a continuation of the vapor pressure-relative humidity conditions and their relationship reported last year by Mr. Duck in his paper given before the NCA. The present research is directed toward the development of a suitable instrument which may be used in actual plant operations for both quality control and development. The objective of this study is to have an instrument that will be workable enough for routine use in the plant. It is believed that if this instrument is made available, together with suitable operating information, supervisory personnel in the plant can be trained in its use. The confectionery industry would then be in a position to take a long step forward in the improved shelf-life of all types of candies which are affected by changes in the moisture content in the air.



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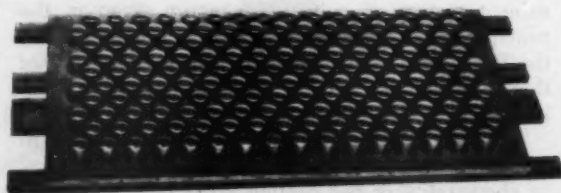
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\*Reg. U.S. Pat. Off.

*Taylor Instruments*  
**MEAN ACCURACY FIRST**

The fourth project has been the publication of the Pennsylvania Manufacturers' Confectioners' Association Abstract Service. You will remember that last year we reported the final plans for the availability of this Service for the year 1957. During last year three issues were released covering the published literature. In 1958 four issues, one every three months, will be made covering the current literature. As previously indicated, we are abstracting approximately twenty-one technical journals covering all phases of the manufacture of chocolate and confectionery. The articles in these journals are being read by a panel of experts, who in turn provide a capsule statement of the important information in these articles for publication in the Abstracts. This service is available to anyone desiring it for a subscription price of \$10.00 per year. Anyone interested in further information in this Service can speak to the Editor Mr. Duck. This latter area, while not specifically a laboratory research type of project, is certainly a most important job. The literature itself is not only vitally necessary as a background for effective research, but in addition, is essential to industry as a source for the tremendous amount of new information which is constantly published both here and abroad.

From this brief outline, it should be apparent that the efforts of the research group are being directed toward the search for fundamental knowledge. This fundamental knowledge underlies and is the basis for the transition of the confectionery industry from an art to a science. You will note that all of the areas of actual laboratory study currently under study can be grouped under one single heading—The Study of the Improvement of the Shelf-Life of Confectionery. While obviously this field has only had its surface scratched, it is certain that if we continue to study the underlying causes which contribute to our every day operating and sales problems and put this basic research information into the hands of the skilled industrial candy maker, we will achieve the results of true research—better products made more efficiently.



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for May 1958 — 19



Wherever Star Milk Chocolates are seen in their NEW Sealright, product-picture-window (it's a Saran picture window) candy package, you'll see incredibly Fast . . . Faster buying action.

Everybody loves a winner — Everybody, everywhere loves Sealright's New customer-winning candy package idea . . . It has that "Buy Me! . . . Take Me Home!" look that spells P-R-O-F-I-T-S . . . wherever seen.

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Best Foods oils will help you produce better confections efficiently and economically—as leading manufacturers everywhere will testify. And Best Foods will always be best for you in terms of service and reliability as well as quality.

**NUCOLINE** — 76°

**FILBISK** — hydrogenated coconut oil, 92°-110°

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Available in desired melting points.



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THE  
BEST FOODS  
INC.

## Odor detection and correction

# H

ave you ever been troubled by an increase in consumer complaints, rising far beyond the minimum every distributor of consumer goods must expect? The complaints can often be attributed to off-odor or flavor in the product.

The problem may appear quite elementary. However, obtaining a clear-cut definition of an odor and/or flavor problem is not as simple as it may seem. We have found that odor and flavor evaluation in the field is primarily a job for the detective. We are all familiar with the methods used in criminal detection; let us see how these methods can be applied to our problem.

What are the known and alleged facts? The information regarding these factors should be obtained.

- a. The history of the problem
- b. Description of the off-odor or flavor
- c. Description of variations in odor or flavor character and intensity.
- d. Probable cause of off-odor or flavor

<sup>1</sup> Account Executive, Foster D. Snell, Inc., 29 West 15 Street, New York 11, New York.

All the facts collected must be sifted and classified as to which are known and which are alleged to be true. The basic background information having been examined, the way is paved for further investigation by one or more experts, who will review the observations of the preliminary investigation of facts, known and alleged, examine available samples, and make deductions as to the probable cause and best approach to solution of the problem. Finally, a confirmatory investigation is made using a trained sensory panel. The panel, selected on the basis of acuity and reliability in the evaluation of off-odors and off-flavors in packaging problems, carefully checks deduced facts, using standard organoleptic procedures. Here is one example, among many possible approaches. Using a physical reference standard, a scoring system for the product is established as follows:

by L. C. CARTWRIGHT  
Foster D. Snell, Inc.

	Perfect Score
Aroma:	
Presence of desirable notes	15
Absence of undesirable notes	15
Flavor:	
Presence of desirable notes	20
Absence of undesirable notes	20
Aftertaste:	
Presence of desirable notes	15
Absence of undesirable notes	15
Total perfect score	100

Code-marked samples of the material to be tested, together with a code-marked reference sample and an identified reference sample are submitted to the panel for critical evaluation. In addition to scoring each sample, panel members will characterize all off-odors and off-flavors and relate them to possible sources, whether from any component of the packaging system or from outside contamination.

Perhaps, a few case histories would demonstrate how the odor and flavor detective operates. We cite, for example, a complaint of a "kerosene" odor and flavor in hard candy drops distributed by a well-known manufacturer. The off-notes were attributed to the retail unit cartons. The candy manufacturer informed their carton supplier of the problem of odor contamination in the shipment of several million units. These cartons were manufactured with an overprint varnish, instead of a gloss ink which had been used previously. The overprint varnish was selected to increase the gloss of the dull background and was also cellophane overwrapped to improve the over-all appearance.

We were called in to study, evaluate and, if possible, solve the problem. Samples of the paper-





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board were aged in clean, odor-free, screw-top jars in contact with hard candy drops. Samples of the hard candy drops were evaluated by sensory panel technics for the characteristic "kerosene" off-flavor after varying periods of aging. The results confirmed the conclusion that the particular off-odor and off-flavor found characteristic of the hard candy drops packaged in the cartons rejected by the manufacturer was caused solely by the improper drying of the overprint varnish used by the client (vaper company) on the run of the several million cartons. The solvent in the overprint varnish was entrapped in the paperboard and contaminated the packaged candy drops. The cellophane over-wrap prevented dissipation of the solvent from the outside of the carton and caused the solvent to migrate further into the paperboard, contaminating the candy drops.

Each component of the packaging system had been examined, separately and in various combinations, in an effort to isolate the offender. The fact that no single component nor combination of components from which the overprint varnish was absent contributed any off-odor or off-flavor to the candy drops, confirmed the conclusion that the overprint varnish was the cause of the off-notes.

A question was raised as to the disposition of the remaining several million cartons. Further testing demonstrated that the unused cartons could be re-conditioned and rendered entirely safe for use in packaging the candy drops. The solution was simply to heat the cartons with adequate concurrent aeration.

In another instance, a client was concerned with "chlorine" and "phenolic" type odors developed in his packaged chocolate candy. Never having had this experience before, he was anxious to determine the source of his dilemma.

We were retained to ascertain the source of the off-odor and off-flavor. In order to determine whether the contributing factor in the development of the off-notes was due to the packaging material, a series of tests were made on samples of the packaged candy.

Standard sensory panel methods were used in conducting the tests. A 3-member panel of trained experts was used for the evaluation tests.

The results showed that the off-odor and flavor development in the candy was due to the presence of an excessive amount of chlorinated phenols in the chipboard cartons. Chlorinated phenols, which can cause the "chlorine" and "phenolic" type odors, are often used for slime control in the manufacture of paper, particularly in the manufacture of chipboard.

A modification of the usual method of analysis was used in a problem involving boxboard used for packaging cigarettes.

The nature of the odor suggested a particular insecticide as the contaminant. Organoleptic comparison of the contaminated cartons with a series of samples of similar carton stock impregnated with increasing percentages of the suspected insecticide led not only to verification of the identity of the

now...handy smaller size...new features

# Tote Boxes

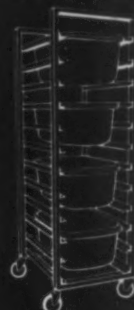
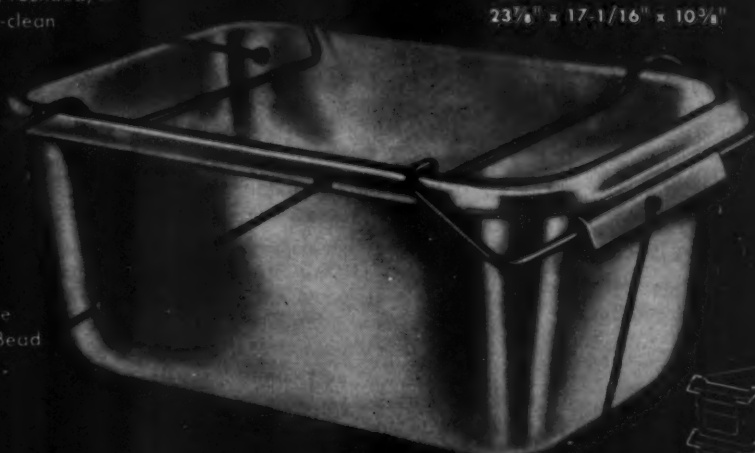
by WEAR·EVER



Smooth, rounded, —  
easy-to-clean  
corners

#24 Over-all Size:  
23 7/8" x 17-1/16" x 10 3/8"

Exclusive  
Open Bead  
design



24 avail-  
able without handles  
to fit Cress-Cor Pan Rack

Strong, smooth  
one-piece handle



Stack  
when filled

#35 Over-all Size:  
34 3/16" x 16 7/8" x 12"



Dolly available for #35  
shown at left



Roll  
when empty

You asked for it... a smaller version of the famous Wear-Ever #35 Tote Box. It's our new #24, shown at top in the above illustration, and it's available now.

We've designed it particularly for you whose needs call for a lighter, smaller, easier-to-handle container. It is available without handles, to fit perfectly in a Cress-Cor pan rack.

This new box incorporates the same quality construction features as our standard size box—special extra hard wrought

Wear-Ever Aluminum Alloy, sanitary open bead and extra strong, double-embossed bottom.

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For full information on our complete line of food handling items, call your local Wear-Ever man, or send coupon below.

Ask us about special equipment to your specifications

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WEAR-EVER ALUMINUM, INC.  
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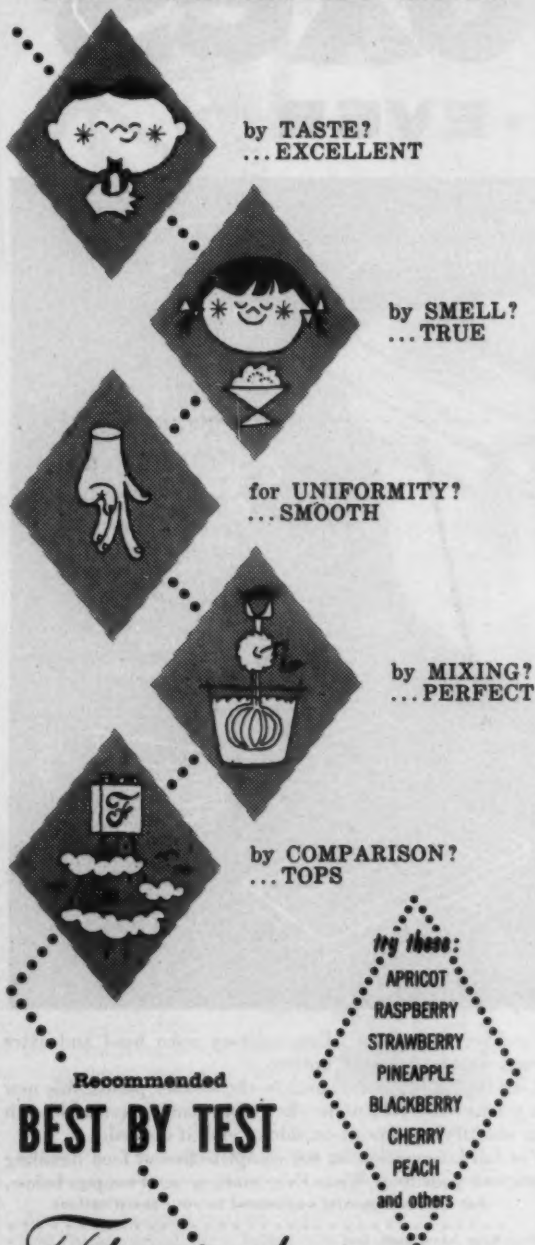
• Wear-Ever Aluminum, Inc.  
• 9905 Wear-Ever Building, New Kensington, Pa.  
• GENTLEMEN: I'd like to know more about your Tote Boxes and other handling equipment.  
• ☐ Send me your catalog. ☐ Have your representative see me.  
• NAME.....  
• TITLE.....  
• Fill in, clip to your letterhead and mail today.  
• NEW IDEA! Wear-Ever's new Nickel Scouring Cloth. Won't scratch, won't mar, far outlasts ordinary scouring cloths. At your dealer's.

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Agents & Distributors in Mexico: CONSOLMEX S. A. Mexico 11, D. F.



contaminant, but also to determination of the amount. This was the very low concentration of approximately 0.005% or 0.1 pounds per ton of board. Correlation of this value with other available data indicated the probable source of contamination was some 2.5 to 5 ounces of the insecticide. The final conclusion was that a single paper bag in which this insecticide had been packed was accidentally present in the waste paper used for making the paper-board. In this instance, no ordinary chemical method was sensitive enough to have permitted either verification of the presence of the particular insecticide or establishment of its concentration in the board.

To summarize, whatever the cause, the nature or the difficulty of the odor or flavor problem in paperboard containers, and whether it confronts mill, converter or user, the odor and flavor detective will use the same logical approach to its solution. First, the problem must be accurately defined, its seriousness and prevalence determined, sources and mechanisms postulated, and these postulates tested. Next, likely corrective measures must be revised and tried. Finally, when the problem appears to be solved, verification of adequate correction should be made under actual, or effectively simulated, service conditions.

Any or all of the usual sensory panel technics may be used in evaluating the odor and flavor quality of paperboard boxes and dividers. These have been adequately covered in the literature on sensory methods. Of course, even with adequate knowledge and sound execution of sensory panel operations, the essence of their effective application to any odor or flavor problem lies in a logical approach, clear thinking, and careful planning, well seasoned with common sense. As always, experience is the best teacher.

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2. Kelley, P. H. and Cartwright, L. C., "Odor and Flavor Quality of Paper-Plastics Combinations", *Tappi*, Vol. 39, No. 3, 188a-90a, (March 1956).
3. Cartwright, L. C., "Flavor Pattern and Flavor Profile", (Part I) *Coffee & Tea Industries*, Vol. 80, No. 3, 79-80, (March 1957); (Part II), *Coffee & Tea Industries*, Vol. 80, No. 4, 79-80, (April 1957).
4. Cartwright, L. C. and Kelley, P. H., "Scheme for Odor Identification with Examples of Its Use", presented at the Conference on Basic Odor Research Correlation held by the New York Academy of Sciences and The American Society of Heating and Ventilating Engineers, May 19, 1953. *Annals N. Y. Acad. of Sci.* 58, Art. 2, 187-92, (March 24, 1954).



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# The odor problem in paperboard boxes and dividers



scientific definition of odor would be the best beginning for this paper. Unfortunately I am not able to do this. Obviously, Webster is too broadly qualitative, but, for the present, a general expansion will serve as a basis for this discussion.

Odor, in itself, is an elusive, sensory effect subject to human interpretation only and not to precise scientific measurement or identification. Only through experience can odors, as well as tastes, be related to their sources. Furthermore, intensity, which from many practical aspects is a critical consideration, can be judged only by human experience. It therefore follows that any experimental or practical work in this field requires an experienced panel of experts to serve as an analytic jury. Reference can be made to the sippers and whiffers of the tea, coffee, tobacco and wine industries. It is not unlikely that your own industry might also be included.

An odor necessarily must be volatile to some degree. It is therefore possible for odors to be transferred from one material to another without direct contact. If the contents of a package are sorptive to volatiles, and many confections certainly are, there must be care in the selection of the package materials. The existence of odor in any package ingredient or component exposes the contents to the development of off-taste and odor contamination. This may appear obvious, but the importance justifies repetition.

Several analytical schemes have been used by the panel technique for identifying and measuring odor in packaging materials. Selection of a method will depend to a large measure on the item to be packaged. TAPPI Standard T483 sm-53 contains many useful suggestions, but other methods may

by K. W. MAX  
Robert Gair Division

also be equally applicable. More of this will be discussed later in the program.

It is not my purpose to classify odors as they may occur in such packaging materials as paper, paperboard, films, inks, adhesives, coatings, etc.; it is sufficient to note that they are so numerous that some broad categories are needed for simplification. According to Sjostrom<sup>1</sup>, a wide cross-section of complaint odors could be analyzed to show 60% attributable to paperboard. Further delineation of the paperboard odor indicated the following:

- |                      |       |
|----------------------|-------|
| 1. Kraft or burnt    | — 5%  |
| 2. Musty             | — 55% |
| 3. Medicinal         | — 20% |
| 4. Papery, cardboard | — 20% |

Although these groups of odor complaints have been classified arbitrarily, they serve as the basis to which this discussion is directed.

The first, kraft or burnt, occurs rarely and is usually insignificant in scope. On occasion, however, an error or mechanical failure can give rise to serious objectionable odor. I remember a personal experience where kraft linerboard for corrugated boxes had a bad odor as a result of a heat exchanger failure; the hot pulp wash water was contaminated by digester blow gases. On the whole, however, this type of odor is under control.

Mustiness is indicated to be the primary odor offender. A musty or moldy odor is usually associated with the presence of microorganisms in paper mill systems. To one degree or another, all systems are plagued with this condition. It is therefore incumbent upon the manufacturer to exercise the necessary precautions for control. These steps normally include proper selection of raw materials

and water quality, the necessary care in storage and a wise selection of antiseptics for mill systems. Incidentally, finished paperboard of all types is relatively free from all microorganisms and completely devoid of pathological types after the sterilizing effect of drying temperatures. The prior presence of these organisms, however, can leave a residual odor.

The medicinal group of odors has also been described as phenolic, aromatic, etc. Although the source of such odor bearing materials might be accidental from water treatment chemicals, waste paper contaminants and the like, substances are very often added intentionally. These are antiseptics. You will remember that mustiness was the chief odor offender in Sjostrom's analysis. In order to control the growth of microorganisms, certain bactericides and fungicides are added to mill systems. One of the major types is chlorinated phenol. The connotation is apparent and sometimes serious odor problems arise from this enigma: What and how much antiseptic can be tolerated and yet control the source of mustiness?

Actually, the situation is more complex than described, but understanding and improved techniques have helped the papermaker cope with the delicate balances.

Of the four arbitrary groups of odors under discussion, it is the last, cardboard or papery as described by Sjostrom, that I would like to cover in more detail. Until recently little was known about this type of odor which, although occurring infrequently, was without pattern.

It was this recognition that led the National Paperboard Association to sponsor special research at the Microbiological and Biochemical Research Center at Syracuse University. Although several years and many thousands of dollars have been spent on the odor problem and related phenomena, it is gratifying to tell you that substantial progress has been made. The so-called "papery" odor has been identified with organic sulfur compounds. This information is most useful in the practical approach to control and correction of odor problems. As this work developed, the paperboard mills were increasingly alert to their problems and responsibility. With new information and assistance available to industry, the problem has been reduced to relative insignificance.

The foregoing has been outlined to give you some background of the mills' problems in controlling odor. Today the existence of odor in paperboard is a rare exception. The fact remains, however, that any specific lot of any type of paperboard may cause packaging problems, and it is therefore of vital interest to you and your package supplier to choose the approach which will minimize the risk.

In cooperation with your reputable supplier, make certain that he is fully aware of your requirements. Details of package design and packing and storage conditions are essential. Various grades and types of paperboard are made for many end uses and unless special note is made, there may be no

more than routine attention given to the odor problem.

To avoid direct contact with the structural elements of the package is basic. This is not only important from an odor and taste transfer point of view, but paperboard is not designed to hold out the greasy components. Once butter fat or vegetable oils contact paperboard, the inherent migration exposes vastly exaggerated surface areas to air, and rancidity may develop. Some grades of paperboard may be treated to relieve such exposure but it is recommended practice to design the package cautiously.

Without direct contact, the volatile nature of odor from package components may still permit transfer. This is especially true if the odors are confined by overwraps, and if these overwraps are applied when the conditions of temperature and humidity are optimum. If at all possible, functional components such as grease and moisture-vapor barriers should be used within the structural body of a package.

It has been suggested that the storage and aeration of paperboard should reduce the possible odor problems. Inasmuch as any specific material causing odor would be dissipated due to its volatility, this procedure could have some value. It should be noted, however, that some odors are latent and develop after periods of storage. On the whole, this approach lacks practical value. Indeed, there are additional hazards to prolonged storage of paperboard cartons and dividers if the conditions of temperature and humidity are not controlled.

The suggestions which have been made will be tempered to a large measure on the product to be packaged. It is quickly apparent that some confections will be more sensitive than others; to a like consideration, the selection of packaging materials will depend on the tolerable intensity thresholds of odor. Each case will become an individual with its own solution.

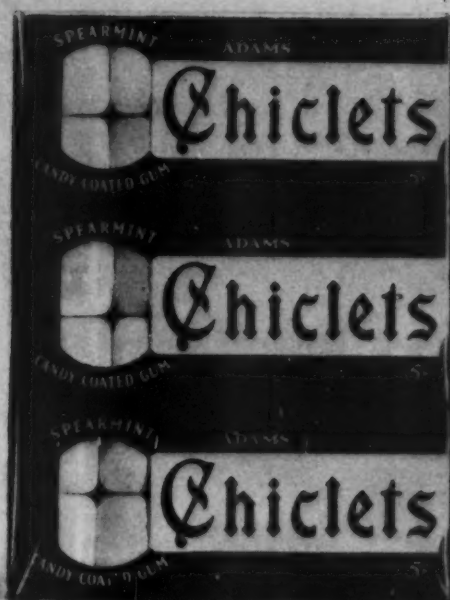
It would be most optimistic for a mill to make an unequivocal guarantee on odor for all paperboard production. On the other hand, many deliveries are being made without undue alarm by either consumer or supplier. Under carefully controlled process and product conditions, paperboard can be produced without serious concern about odor. It is imperative, however, that all parties understand the problem and exercise the necessary precaution through methods and techniques which are available to them.

It would be possible to tell you much more about the technical details of odor and its sources, the conditions which foster the transfer to packaged contents, the means by which flavor protection can be better assured and the precautions which should be taken. The best advice I can give is to share your problems with your package supplier and work out a mutually acceptable package for your requirements.

1 Sjostrom, TAPPI 37, No. 5: 156A (1954)

2 Russell, Unpublished Report to National Paperboard Association (1957)

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stops  
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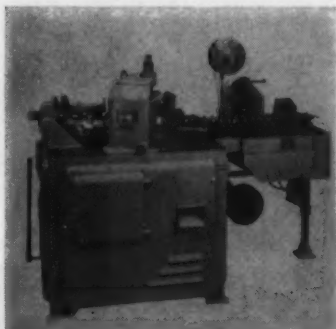
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Available in 4-pan Systems and up. A non-skilled help operation with a daily output of approximately 1,000 pounds per pan.

#### **LATINI CHOCOLATE SPRAYING SYSTEM**

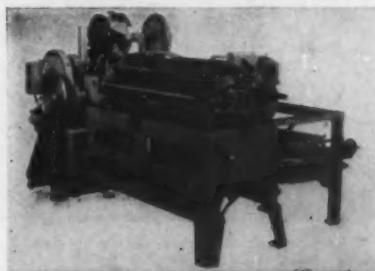


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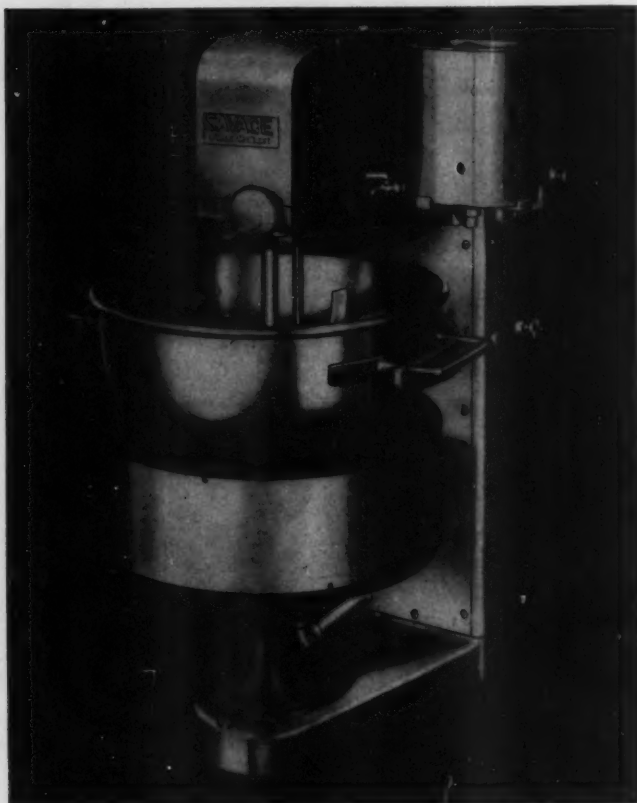
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## Supply Field News

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A. E. Staley Mfg. Co. has been named exclusive national distributor of "Hip-O-Lite" Marshmallow creme through its grocery products division. The marshmallow is made by Hipolite Company of St. Louis, Missouri.

Penick & Ford Ltd., Inc. has elected O. H. Tousey a director of the corporation. Housey has been with the firm for 26 years serving as Sales Manager since 1950 and a Vice President since 1957.

H. Kohnstamm & Co. has elected Dr. Samuel Zuckerman, plant superintendent, to the position of vice president. Dr. David Jorysch, technical director of the flavor department, and Dr. Robert Cooney, a research supervisor, have been appointed assistant vice presidents.

All three of the chemists have been with the firm for more than 20 years. Zuckerman joined Kohnstamm in 1936 and became technical director of the Organic Color Division in 1950 and plant superintendent in 1954.

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# New Products

High-impact polyethylene film has been introduced for uses where resistance to rough handling is important. It is much stronger than standard film, and is also cleaner and shinier. This film is expected to sell at a price similar to standard types of polyethylene.

For further information write: *Plastics Division, The Visking Company, Terre Haute, Indiana.*

Care of Wooden Pallets is a new booklet that summarizes rules of handling, maintenance and care of wooden pallets to prolong their useful life. It provides valuable repair information and instructions for fork lift operation in minimizing damage in service.

For a copy write: *National Wooden Pallet Manufacturers Association, Barr Building, Washington 8, D. C.*

An automatic wrapper imprinter has been developed for use on wrapping and bag making machines. It can imprint legends or codes up to 4" wide by 6" long on any flexible packaging material as it is fed into a packaging machine. Accurate registration with the web is possible. Quick changing rubber type is used where frequent changes are necessary.

For further information write:

*Adolph Gottscho, Inc., Hillside 5, N. J.*

An improved twist wrapping machine for individual hard candies has been developed giving speeds of 230 per minute on solid and filled items. An automatic feed is mounted on the machine, though a hand feed is also available. This is a modified model of a standard twist wrap machine with improved cams and paper picker for higher speed operation.

For further information write: *Package Machinery Company, East Longmeadow, Massachusetts.*

An exceptionally clear polyethylene has been developed from linear polyethylene resin. It can be printed and heat sealed in a similar manner to standard poly. It is considerably stiffer than standard poly, and it is claimed that it will work in the common types of overwrapping machines which require stiffness for "push-button" operation.

For further information write: *Phillips Chemical Company, Bartlesville, Oklahoma.*

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\*The installation at A. Cramer Corp., Oak Lawn, Ill., consists of two MIKRO-ATOMIZERS, each connected with and discharging to MIKRO-COLLECTORS.

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## Calendar

- May 3: Gopher Candy Club, annual dinner, Leamington  
Hotel, Minneapolis, Minn.
- May 5-9: National Restaurant Convention & Exposition,  
Navy Pier, Chicago
- May 14: New England Manufacturing Confectioners Assn,  
annual meeting
- May 18-21: Flavor Extract Manufacturers Convention,  
Edgewater Beach Hotel, Chicago
- May 24: Empire State Candy Club annual dinner dance,  
Hilton Statler, Buffalo, N.Y.
- May 25-29: Institute of Food Technologists, Annual meet-  
ing, Palmer House, Chicago.
- May 26-28: National Sales Aid Show, Roosevelt Hotel,  
New York
- May 26-30: AMA National Packaging Exposition, Coli-  
seum, New York City.
- June 13-15: Pennsylvania Manufacturing Confectioners  
Assn annual meeting, Galen Hall, Wernersville, Pa.
- June 15-18: Metropolitan Candy Brokers Show, N. Y.  
Trade Building, New York City
- June 16-19: Southern Candy Jobbers Convention, Miami.
- July 6, 7, 8, 9: Associated Retail Confectioners Annual  
Convention, Mark Hopkins Hotel, San Francisco, Calif.
- July 6, 7, 8, 9, 10: National Confectioners Assn., Sher-  
aton Palace, San Francisco, Calif.
- July 13-19: National Confectionery Salesmen's Ass'n Con-  
vention, Hershey, Penna.
- August 3-7, National Candy Wholesalers Assn., Inc. an-  
nual meeting, Commodore Hotel, New York, N. Y.
- August 11-13: Western Packaging & Materials Handling  
Expositon, Civic Auditorium, San Francisco
- August 12: Chicago Candy Production Club All-Industry  
Golf Tournament, Chicago
- August 24-27: Boston Candy Show, Boston, Mass.
- August 24-27: National Fancy Foods & Confections Show,  
Waldorf-Astoria Hotel, New York City
- September 21-23: Philadelphia Candy Show, Benjamin  
Franklin Hotel, Philadelphia
- December 13: National Food Sales Conference, Chicago,  
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# Candy Clinic

The Candy Clinic is conducted by one of the most experienced superintendents in the candy industry. Some samples represent a bona-fide purchase in the retail market. Other samples have been submitted by manufacturers desiring this impartial criticism of their candies, thus availing themselves of this valuable service to our subscribers. Any one of these samples may be yours. This series of frank criticisms on well-known branded candies, together with the practical "prescriptions" of our clinical expert, are exclusive features of The MANUFACTURING CONFECTIONER.

## Easter Candies; \$1.20 and up Chocolates;

**Code 5B8**  
**Assorted Chocolate Creams**  
**1 lb.—\$1.45**  
(Purchased in a department store, Chicago, Illinois)  
**Appearance of Package:** Good.  
**Box:** Long oblong, one layer type. White glazed paper top. Printed design of pink, black, overall. Name printed—blue. Cellulose wrapper.  
**Appearance of box on opening:** Good.  
**Number of pieces:** 36  
**Light Coated:** 24  
**Dark Coated:** 12  
**Coatings:**  
Colors: Good.  
Gloss: Good.  
Strings: Good.  
Taste: Good.  
**Light Coated Centers**  
Vanilla Caramel: Good.  
Pecan Top, Van. Caramel & Cream in layers: Good.  
Chopped nuts & Choc: Good.  
Chocolate Caramel: Good.  
Brazil Nuts: Good.  
Light Yellow Cream: Could not identify flavor.  
Caramallow: Good.

Choc. Cream: Good.  
Maple Cream: Good.  
Almonds: Good.  
**Dark Coated Centers**  
Honeycomb Chips: Good.  
Van. Cream: Good.  
Lemon Cream: Good.  
Pink Cream: Could not identify flavor.  
Orange Colored Cream: Could not identify flavor.  
**Assortment:** Fair.  
**Remarks:** Suggest a few hard candy pieces, a good jelly, nougat, etc., be added to improve assortment. Flavors need checking up, also quality of flavors. Assortment is not up to the standard of this priced chocolates.

**Code 5C8**  
**Assorted Chocolates**  
**1 lb.—\$1.50**  
(Purchased in a candy store, Chicago, Illinois.)  
**Appearance of Package:** Fair.  
**Box:** Oblong shape, one layer type. White glazed paper. Top printed in red and gold. Outside paper wrapper, yellow. Overall printed name—silver.  
**Appearance of box on opening:** Poor.

**Number of pieces:**  
Light Coated: 8  
Dark Coated: 6  
Bon Bon: 1  
**Coatings:**  
Colors: Good.  
Gloss: Fair.  
Strings: Fair.  
Taste: Good.  
**Dark Coated Centers:**  
Pink Cream: Could not identify flavor.  
Maple Walnut Cream: Good.  
Honeycomb Chips: Good.  
Buttercream: Good.  
Nut Nougat: Poor.  
**Light Coated Centers:**  
Vanilla Cream: Good.  
Choc. Buttercream: Good.  
Choc. Cream: Good.  
Nougat: Poor.  
Choc. Raisin Cream: Good.  
Coconut Cluster: Good.  
Choc. Paste Rolled in chopped nuts: Good.  
**Assortment for a half pound:** Good.  
**Remarks:** Box is too large for a half pound of chocolates. Suggest using some dividers. Also wrap the chocolate paste rolled in nuts in cellulose as fine pieces of nuts were all over the other pieces. Pieces are too large for \$1.50 a pound chocolates.

## Candy Clinic Schedule For the Year

JANUARY—Holiday Packages; Hard Candies  
FEBRUARY—Chewy Candies; Caramels; Brittles  
MARCH—Assorted Chocolates up to \$1.15  
APRIL—\$1.20 and up Chocolates; Chocolate Bars  
MAY—Easter Candies; Cordial Cherries  
JUNE—Marshmallows; Fudge  
AUGUST—Summer Candies  
SEPTEMBER—Uncoated & Summer Coated Bars  
OCTOBER—Salted Nuts; Gums & Jellies  
NOVEMBER—Panned Goods; 1¢ Pieces  
DECEMBER—Best Packages and Items of Each Type Considered During the Year.

**Code 5D8**  
**Assorted Chocolates**  
**1 lb.—\$1.50**  
(Purchased in a candy shop, Chicago, Illinois)  
**Appearance of Package:** Fair.  
**Box:** Oblong shape one layer type. Grey paper wrapper, name imprinted in light grey. Box top printed in brown and white stripes. Name — black.  
**Appearance of box on opening:** Fair.  
Two broken pieces.  
**Number of pieces:**  
Dark Coated: 11.  
Light Coated: 6.  
**Coatings:**  
Colors: Good.

**Taste:** Good.  
**Dark Coated Centers:**  
**Buttercream:** Good.  
**White Cream:** Hard and dry, could not identify flavor.  
**Dark Walnut Cream:** Good.  
**Chocolate Cream:** Good.  
**Nut Nougat:** Good.  
**Choc. Nut Car.:** Good.  
**Honeycomb Chips:** Good.  
**Mint Cream:** Good.  
**Light Coated Centers:**  
**Buttercream:** Good.  
**Maple Cream:** Good.  
**Choc. Paste Cream — Mint Flavor:** Good.

**Assortment:** Good for a half pound.  
**Remarks:** Suggest that the white cream centers be checked as they are not up to standard. Pieces are too large for \$1.50 a pound chocolates.

**Cream:** Could not identify flavor.  
**Cordial Cherry:** Good.  
**Peanut Cluster:** Peanuts were soft.  
**Van. Coconut Paste:** Good.  
**Nut Coated piece—Choc. Paste:** Good.  
**Assortment:** Fair.

**Remarks:** Chocolates are not up to the standard of other chocolates we have examined at this price. Suggest flavor be checked up.

1 lb.- .60

**Appearance of Package:** Good.

Appearance of box on opening: Fair.

**Number of pieces:**

**Light Coated: 7.**

**Dark Coated: 8.**

**Rolled in chopped Nuts: 1.**

### Coatings:

**Colors:** Good.

**Gloss:** Fair.

**Strings:** Fair.

**Taste:** Good.

### Dark Coated Centers:

**Van. Caramel:** Good.

**Cream:** Could not identify flavor.

**Choc. Cream: Good.**

**Orange Colored Cream:** Could not taste any flavor.

**Van. Marshmallow:** Good.

**Pepp. Cream Wafer:** Poor cream and flavor.

### Light Coated Centers:

**Cordial Cherry:** Dry and hard.



ONCE  
IN A BLUE MOON

a **NEW** candy  
flavor  
comes your way

**Butter  
Kernel**  
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A new concept in butter goodness . . . plus an elusive nut meat character. Perfect for flavor-uniformity in nut pieces, pralines, chews, centers, etc., at low cost.

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TUBULAR STAND FOR  
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DOUBLE MOTION AGITATOR  
EXTRA STRONG FOR LIGHT,  
MEDIUM AND HEAVY MIXES

HAMILTON CW-TILTING  
TYPE MIX-COOKER

40 GAL. ILLUSTRATED—SIZES: 30 TO 150 GAL.

**Dark Coated Centers:**

**White Cream:** Could not identify flavor.

**Glacé Pineapple:** Good.

**Assortment:** Fair.

**Remarks:** Chocolates not up to the standard of other \$1.50 the pound chocolates. Flavors need checking up. The vanilla chew doesn't belong in a \$1.50 assortment. Very cheap piece. Box needs a divider as pieces were all turned over.

**Code 5H8**

**Milk Chocolate  
& Coconut Bar**

**1½ ozs.—10¢**

(Purchased in a chain drugstore,  
Chicago, Illinois)

**Appearance of Bar:** Good.

**Size:** Good.

**Wrapper:** Red paper band printed — white buff and brown, inside foil wrapper.

**Bar:**

**Choc. Milk:**

**Color:** Good.

**Gloss:** Good.

**Texture:** Good.

**Molding:** Good.

**Taste:** Good.

**Coconut (Toasted):** Good.

**Remarks:** A good eating chocolate bar, of this type.

**Code 5I8**

**Chocolate Filled Bar**

**1½ ozs.—10¢**

(Purchased in a chain drug store,  
Chicago, Illinois)

**Appearance of bar:** Good.

**Size:** Good.

**Wrapper:** Gold paper backed foil, inside wrapper of choc. glassine paper.

**Bar, Molding:** Good.

**Coating, Dark:**

**Color:** Good.

**Gloss:** Fair.

**Taste:** Good.

**Bar is made in a shell mold—four sections**

**Center:**

**Choc. Paste, Color:** Good.

**Texture:** Good.

**Taste:** Good.

**Remarks:** The best bar of this type we have examined this year.

**Code 5J8**

**Milk Chocolate Bar**

**4 ozs.—19¢**

(Purchased in a chain drug store,  
Chicago, Illinois)

**Appearance of bar:** Good.

**Size:** Good.

**Wrapper:** White paper; printed in blue and gold. Inside foil wrapper.

**Bar:**

**Chocolate Milk:**

**Color:** Good.

**Gloss:** Good.

**Texture:** Good.

**Molding:** Good.

**Taste:** Good.

**Remarks:** The best Milk Chocolate Bar we have examined in some time. Very good milk flavor and very well refined. A good eating solid chocolate bar.

**Code 5G8**

**Assorted Chocolates**

**1 lb.—\$1.50**

(Purchased in a candy store,  
Chicago, Illinois)

**Appearance of Package:** Fair. Oblong shape one layer type. Light brown paper wrapper, printed with dark brown lines. **Box:** White glazed paper. Name embossed in Gold.

**Appearance of box on opening:** Good.

**Number of pieces:**

**Light Coated:** 7.

**Dark Coated:** 8.

**Coatings:**

**Colors:** Good.

**Gloss:** Fair.

**Strings:** Fair.

**Taste:** Good.

**Light Coated Centers:**

**Buttercream:** Good.

**Van. Cream:** Good.

**Choc. Paste:** Good.

**Nut Cream:** Good.

**Van. Caramel:** Good.

**Fruit & Nut Nougat:** Good.

**Dark Coated Centers:**

**Orange Peel:** Good.

**Coconut Cream:** Good.

**Van. Nut Cream:** Good.

**Buttercream:** Good.

**Assortment:** Fair.

**Remarks:** Pieces are too large and a very poor assortment for \$1.50 a lb.





*Sweets for the sweetest,  
There's no question at all  
They look and taste freshest  
Made with Merck Sorbitol\**



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This is the third of five installments of an article dealing with future planning of production processes and factory layout, with particular emphasis on new factory construction.

## Your future factory

BY V. P. VICTOR, M.E., P.E.

Consulting Engineer, New York City

### V. Project organization

Smooth functioning of any project, i.e. small or large, from its inception to the actual operation, depends upon the establishment of an efficient organization to handle all pertinent matters.

More man-power is required on the larger job than on the smaller job. This applies to the engineering staff, clerical force and to the construction crew.

Certain simplifications or shortcuts could be effected on a smaller job. However, regardless of the size, the basic elements of a suitable organization must be set up and maintained. The primary aim is to exercise positive control over the cost and the progress of the project throughout all stages. Progress signifies systematic and orderly procedure of carrying out and coordinating all component jobs with due emphasis placed on the time element.

Time and cost are interdependent.

Additional time spent on engineering, specifications, inquiries, scheduling and other preparatory work prior to the start of construction will save money and man-hours in field.

In other words, the beginning of the construction may be retarded by the preparatory work, but the overall time required for the completion will be substantially shortened.

Detailed drawings and specifications outline the exact scope of the job to each bidder. Placing contracts on a competitive firm price basis, with full cognizance of labor aspects, is good business, to say the least. On the other hand, the majority of the "cost plus" contracts are well seasoned with misunderstanding, discrepancies and expensive surprises. There is also a decided difference in the attitude on the part of the contractor and his crew when the necessity of meeting the estimated cost no longer exists.

Whenever such unhealthy conditions arise, the

control over the cost and progress of the job is irrevocably lost.

Hence, one fallacious way to reduce the plant investment is at the sacrifice of adequate preparation on paper.

Most assuredly, this shortcut will have a boomerang effect of unexpected magnitude and jeopardize the success of the entire project.

Unfortunately, many manufacturers lack the experience and the criteria against which to measure the required time and, hence, the cost of the engineering work.

During the construction period, certain simplified cost records and progress reports should be kept up-to-date.

The cost control records comprise all monthly expenses, cumulative costs, commitments, etc.

The progress or the "activity accounting" reports consist of the weekly or monthly comparisons of the planned vs. completed goals with pertinent cost data, schedules of deliveries and of other

**Editor's Note:** V. P. Victor has an extensive background in process engineering, with particular emphasis on air conditioning, refrigeration and process heat exchange.

In his work with candy manufacturers, he has had considerable experience in candy machinery development, process engineering and factory layout.





miscellaneous information required for the prompt expedition of the job.

Careful scrutinization of the above records will enable one to anticipate shortages, delays and other troubles, and to take corrective measures in time.

At a later date, the reports should include all data on the inspections, tests and acceptances of contracts and of the performances of various installations or individual machines.

In order not to leave any room for the duplication of efforts, contradictions and delays, one person should be assigned to act as a clearing house.

This man could be called a project engineer, coordinator or a project manager. He should be on the owner's or on the engineer's payroll and devote most or all of his time to the following principal duties:

1. Confirm in writing any decisions and major topics of all meetings giving the date, persons present and the future course of actions.
2. Issue specific orders to all contractors and suppliers, but only after these have been duly approved by the owner (management). The engineer and the architect should also be consulted beforehand.

Conversely, no member of the owner's staff, of the engineer's office and of the architect's office should by-pass the project manager by giving direct orders. Should, for the sake of expediency or any other reason, such an ex-

ceptional action be imperative, the project manager to be notified immediately in order to issue a confirming order.

3. Clear up any discrepancies, conflicting or confusing matters by referring them to the originating sources.
4. Keep track of all communications, pending subjects waiting for decisions and, in general, to act as an expeditor of the entire project. All pertinent files, records, prints of drawings, copies of specifications and contracts should be placed under the project manager's control.

Under no conditions, should the foregoing restrict or hinder in any way the direct contacts or correspondence between all parties, but only requires that copies of all letters or memorandums be sent to the master files of the project manager.


#### VI. Process design

The main elements of any process are materials, machines and people. Quantity and quality, related to time, are the tangible results and, hence, the measuring sticks of their output.

These components have one common denominator—flow.

In an ideal production line, the materials travel in a continuous uniform pattern and along a direct path from raw materials storage to finished stock.

The nature and sequence of the operations determine the types, number and arrangement of pertinent machinery.



**When it comes to quality—  
people mean more  
than machines**

**We** know it takes more than our modern machines to fill your demands for quality chocolate products.

That's why our people use their special skills to make certain you get the quality you insist on.

**WILBUR-SUCHARD CHOCOLATE COMPANY, INC., Lillitz, Penna.**

The raw materials, the goods-in-process and the finished stock are subject to additional activities—materials handling and storages.

The storages have a great strategic value. Their size and location provide a flexible "cushion" to absorb the introduction of new products, expansion of existing facilities, etc.

The second practical feature of an intermediate storage is to provide for the continuity of production when a machine on the main line is down.

Machines continue working on the preceding operations and depositing their output into the storage for the future work of the broken machine. Machines on the following operations continue working by withdrawing from the storage the previously accumulated output of the broken machine.

In this manner, the down machine is by-passed and time is gained for its repair.

The third function of this "deposit and withdraw bank" is to balance the production rates of several machine operations or even departments.

The advent of true automation will eventually decrease the value of intermediate storages as banks.

However, during any foreseeable future the building must be viewed not just as a cover for the process, but as an integral part of the process.

Failure to recognize the foregoing may lead to an abortive economy of purchasing an existing unsuitable building rather than putting up a new one.

The process design is governed by one or more of the basic manufacturing objectives of the new plant, namely—

1. Increase production of old products using present principles and machinery;
2. Manufacture old products using present principles and machinery, but with certain significant departures or improvements;
3. Make old products by an entirely new process;
4. Make new products by methods which were tried and proven elsewhere, and
5. Make new products by a new procedure.

In the last instance, the risk and the element of the unknown are offset by the maximum freedom of actions and choice as well as by ample opportunities for original thinking.

An ultra conservative approach would call for a gradual evolution from the laboratory—glassware stage to the pilot plant experimental era to the scaled-up production operations and finally to a full fledged manufacturing line.

By-passing, to a greater or lesser extent, the foregoing steps should be recognized as a "calculated risk", which may save time and money but is definitely a hit or miss proposition.

It is not within the scope of this paper to discuss the relative merits and the feasibility of the technological shortcuts with related "after costs" of corrections and adjustments.

Hence, it is assumed that the products and the process, as a whole, have been clearly established.

The process design comprised the following steps:

## MAXIMUM COVERAGE

from each pound of coating

Are you sure that you are covering as many centers from each pound of coating as possible? Many manufacturers are not and don't realize it.

Only the Stehling Mixer gives you a large supply of liquid chocolate, properly melted, properly manipulated, and held in suspension ready for the most economical coating operation.

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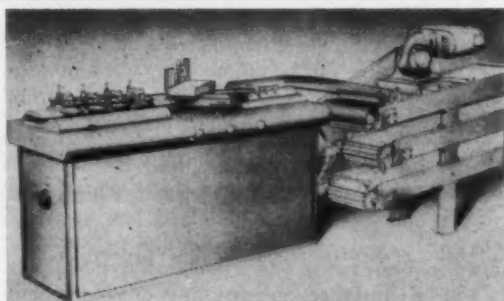
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New Style—Twister, Cutter & Straightener  
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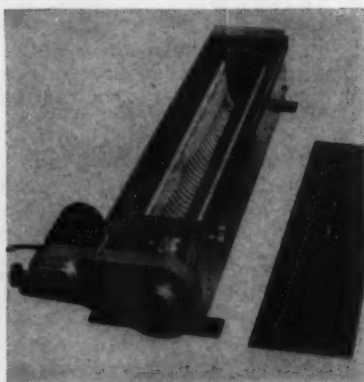
**Hohberger**  
**Cream Machine**

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Straight sugar or with any  
amount of corn syrup.



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**Continuous Hard**  
**Candy Cutter**

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filled pieces.



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Saves Labor—eliminates from 2 to 6  
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Versatile—variable speed drive, eleva-  
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belts make a wide variety of markings.

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1. Establish the materials flow chart.
2. All operations must be listed in the proper order with all pertinent information carefully compiled.

Quantities, temperature, volume, pressure, time, specific product changes, inspection and control points, required end results and any other collateral data must be assiduously tabulated. Very often the quantitative analysis is dealt with on a unit basis and the required production rates are injected later. This facilitates the computations (scaling up and down) and the comparisons between the actual and the required machine capacities.

3. Translate the flow charts into equipment. This job calls for a fresh unbiased viewpoint backed by broad experience, skill and thorough understanding of the specific problems with all ramifications. The foregoing is more than a handsome phrase.

Machine evaluation, comparison and selection is a very important and delicate matter.

The buyer and the seller always agree that the job should be done in the simplest and the most economical way consistent with efficient operation.

However, there is usually a difference of opinions as to what constitutes the simplicity, economy and efficiency.

It is the buyer's job to interpret the machine features and the business aspects of the purchase in the light of the suitability to his own specific requirements.

Standard machine types should be considered first. Initial cost, delivery and presumably a proven record of past performance weigh heavily in their favor.

Next possibility is the utilization of a modified (converted) machine, i. e. retaining a maximum of standard construction details but with an attachment specially designed and built for the specific operation.

Last is the development of a new machine.

The development of a special machine should be regarded as a research project.

It would be impossible to find any research institution that would be willing to take on a job on a "no success-no pay" basis.

No experienced designer or mature manufacturer of special equipment can very well undertake development of a new machine at a fixed (not exorbitant) price and on a guaranteed performance basis.

There are too many unknowns which cannot be anticipated on a drawing board.

Results produced under actual operating conditions on the production floor are the sole criterion of the "guaranteed" performance and, hence, of the machine acceptance.

The refinements, adaptations and "taking the bugs out" even on a well designed and built machine may take weeks and months.



Needless to say, the duration and cost of the field work can only be guesstimated.

Many machines and experiments have been prematurely or unjustly condemned simply because either not enough time was allowed for the introduction stage and/or the purchaser did not fully cooperate with the machine builder.

The foregoing does not imply that a sound conception and a right principle cannot be incorporated into a flexible and adaptable machine.

The road from the highly nebulous state to the full fledged production machine should be covered by an over-all plan or policy comprising all component steps.

These should be established in relation to each other and in proper continuity.

Only then can the whole development program be carried out in a logical, integrated order with firm control over the cost of each step.

Conversely, giving "in toto" and on a "cost plus" basis the development project to a machine building concern, even of a recognized repute, will eventually lead to misunderstanding. The latter will impede the progress and in a good many cases, culminate in litigations. The end result is a total loss to all participating parties. Such a sad and expensive experience is then followed by a prolonged and unduly conservative period.

The rational development procedure comprises

five consecutive steps, namely—

1. Establishment of the objective.

Clear statement of the problem, with due stress placed on the details, is paramount. Withholding information and excessive secrecy work like the Chinese wall, i. e. may offer protection but also stop the influx of ideas.

2. Principle of operation.

The practicability of doing the contemplated job should be demonstrated and proved on a prototype model or machine.

3. Machine design, which consists of preparation of the general layouts as well as of the detailed drawings of all machine parts.

4. Machine construction, which also includes the shop testing, i.e. running of the completely assembled machine with or without the product.

5. Machine introduction.

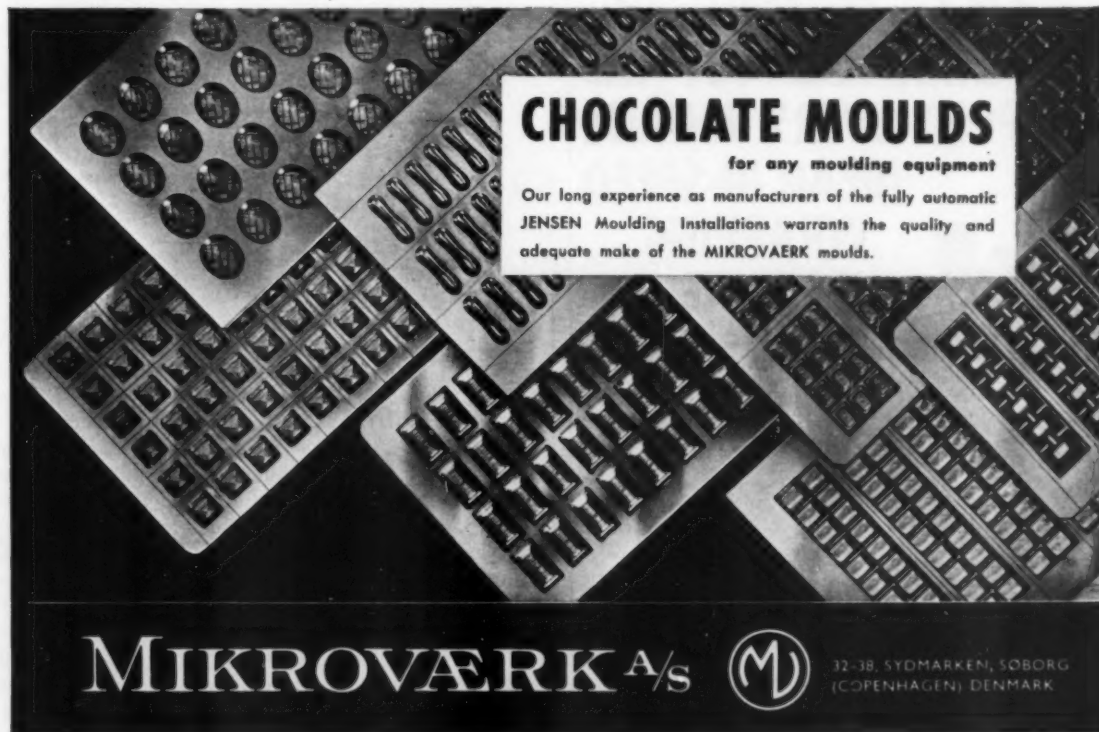
Provisions must be made to install the machine in the plant and to operate it with the full participation of the production staff, machine designer and the machine builder.

Tests should be carried out in a systematic and not in a haphazard manner.

Ample time must be allowed.

The secured data will pave the way to the improvements and, in an extreme case, lead to the machine re-design and construction.

Universally, the second machine generation



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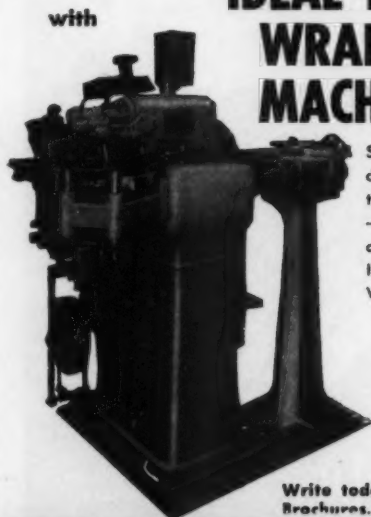
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STANDARD or STAGGERED  
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starts up and turns out production without a hitch.

The above dissertation on the technical aspects of a development project may seem too elaborate.

The ever-growing value of a specialized device or a machine lies in the transfer of skill and the money making potential.

Very often, the economics warranted the development of special purpose machinery, technical "know how" was available but the project bogged down in the administrative quagmire.

The outlined five steps could be dealt with almost independent of each other and enable one to exercise firm control throughout, especially from the financial viewpoint.

The decision to use the existing machine, to purchase a new machine or to develop a special machine should be guided by the following considerations:

1. Pertinent economics.
2. Quality of the product.
3. Output and reduction in scrap.
4. Operating range and versatility.
5. Simplicity, degree of built-in automatization and safety devices, ruggedness of construction, ease of repairs and maintenance.
6. Compliance with safety and sanitary codes.
7. Extent of the required auxiliary services (water, steam, power, refrigeration, air, etc.).
8. Provisions, if any, for automatic infeed and removal of product from the machine, i.e. degree of automation.
9. Records, if any, of previous performance on similar jobs.
10. Financial and business integrity of the vendor. Availability of spare parts and factory service in the future.
11. Installation requirements, i.e. erection time, floor area, height, foundations, etc.
12. Labor aspects.
13. Possibility of machine obsolescence relative to alternate means of doing the same job.
14. Delivery period.

One could easily write a book on each of the above topics. It will suffice to say that numerous concerns have adopted definite policies on the purchase or replacement of equipment.

Naturally, the policies emphasize the financial phase. But they also pinpoint the essential pre-requisites for evaluation or comparison between the existing and new methods.

This analysis will either lead to the purchase of new equipment or provide an indicator of the competitive standing of the existing facilities, i.e. obsolescence.

The breakdown of the pre-requisites is not easily delineated as it is highly individualistic.

In general, the range of possibility of choosing the equipment is great.

From the smallest, hand operated to big completely automatic machines, all have their place in one factory or another.

An analogy, to illustrate the suitability, could be drawn in a ferry boat crossing the river and a liner crossing the ocean, but not vice versa.

#### VII. Production Line

By themselves, the machines, no matter how modern and efficient, do not constitute a production line.

The latter could be defined as an arrangement of work facilities where the materials move from the raw materials storage to the finished stock storage, a) continuously, b) at a pre-determined rate, c) along an established path and d) pass through strategically located inspection stations.

The complete fulfillment of the above ideal is the Nirvana of true automation.

The most significant part of automation is that the materials move *continuously*, not only through the processing operations but from one to another.

This dynamic concept of manufacturing calls for one to—

1. Determine the pattern of the main flow line of each product and then assemble them together into one manufacturing unit.
2. Spot previously selected equipment types along the flow lines.
3. Balance the capacities of the processing ma-

chinery. Due emphasis to be placed on the time element, safety banks or storages and the future expansion.

4. Interconnect and integrate all machines into one smoothly functioning production unit.

Overlooking or minimizing either of the above four constituents will impair or even completely wreck the performance of the line, as a whole.

Hence, should a weakness or a deficiency in planning be discovered, all four steps should be reworked.

Second and any subsequent rounds will take only a small fraction of the first attempt.

To determine the line of flow through the plant one must first get an approximate idea of the length of a fully equipped line with all auxiliary work areas.

In an existing building, freedom of action is limited by the dimensions, present facilities which are hard, if not impossible, to relocate, etc.

Certain compromises would have to be made, which either increase the initial cost or, worse, impose repetitive expenses on the manufacturing.

In case of a new building, there are no handicaps and a wide latitude in design is permitted.

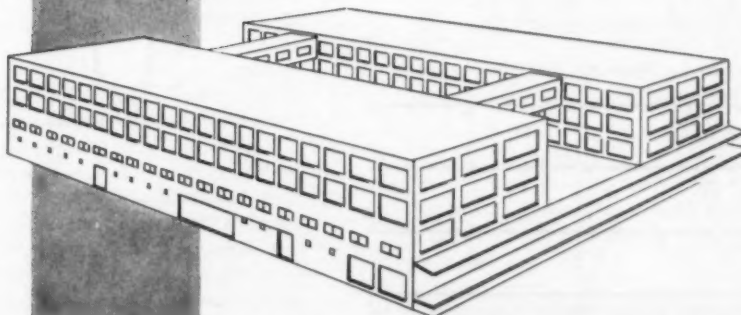
There are four basic patterns of flow lines, namely 1) straight line, 2) "U" shaped line, 3) circular line and 4) angular flow.

For the sake of clarity, the selection and the procedure in laying out a production line are described separately.



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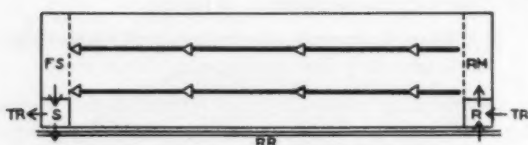


Figure 1

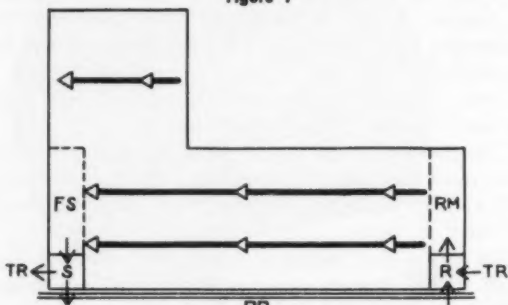


Figure 2

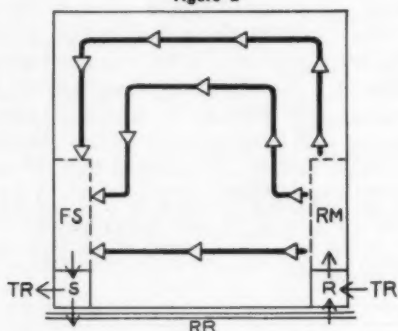


Figure 3

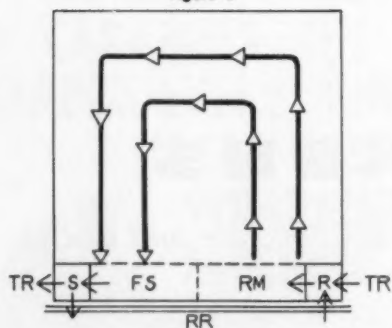


Figure 4

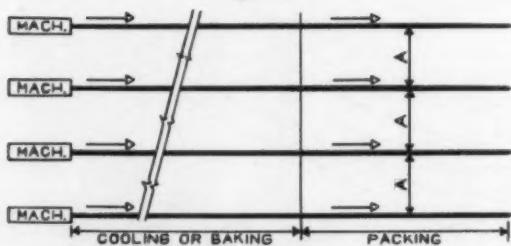


Figure 5

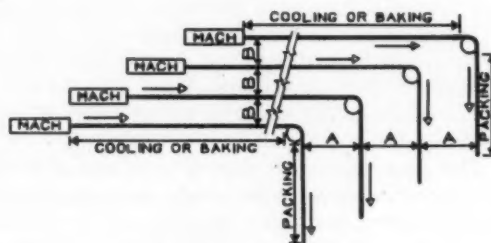


Figure 6



OUTSIDE LINES PROGRESSIVELY LONGER

Figure 7



ALL LINES EQUAL LENGTH

Figure 8

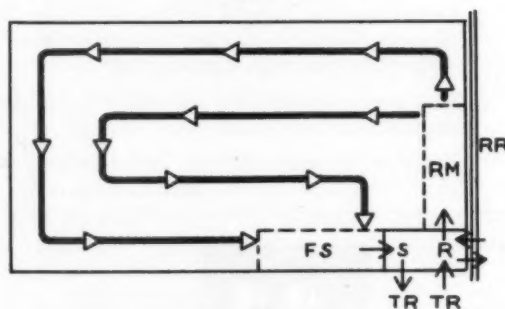


Figure 9

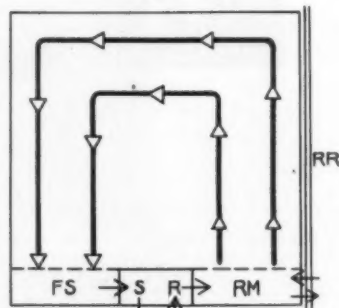


Figure 10

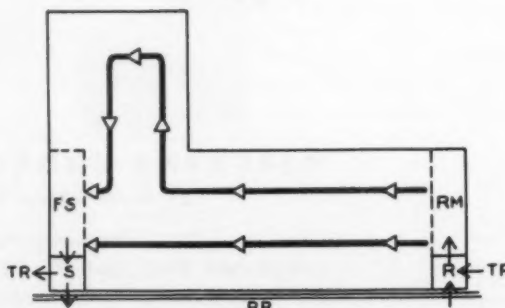


Figure 11

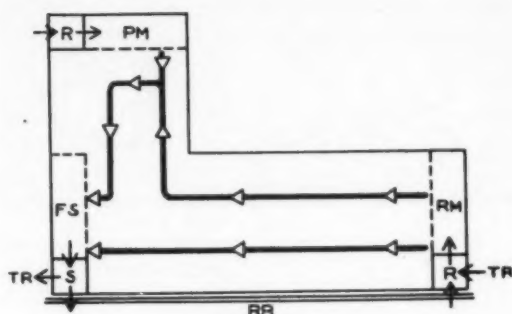


Figure 12

1. Straight line, single or several in parallel.

In this case the receiving is located at one end of the long building and the shipping at the opposite end. The installation of equipment, work areas, banks and of the duplicate lines is facilitated and the conveyors are simplified.

The straight line pattern is suited primarily for the production lines of approximately the same lengths, as illustrated on Fig. 1.

Different products may require longer and shorter runs. Should the difference in lengths be appreciable, then difficulties will be encountered in locating (without wasting the floor area) either a common shipping or a common receiving department, as shown on Fig. 2.

Another inherent disadvantage lies in the long communication distance between the building ends.

2. "U" shaped line, single or several concentric lines, outlined on Fig. 3 and 4, offers the following advantages:

Receiving and shipping are in proximity of each other.

Travel time and distances are reduced, which allows easier supervision and, possibly, less trucking.

A number of production lines of different lengths for various products could be easily fitted together without upsetting the storage areas and the related materials handling.

Considerable floor area could be saved where a production line consists of long ovens, tunnels, cooling belts, etc. discharging directly on the packing belt.

The tunnels, for example, could be put on narrow centerlines. However, the packing belts require a lot of room between them for access aisles, wrapping machines, hand packing, etc. A right angle turn allows the positioning of the long tunnels on short centerlines and then spreading them apart for the packing belts. The drawback is that each line, i.e. inside the "U", has to be made progressively shorter or (for equal length) the start and the end of the lines will be on a bevel. Fig. 5, 6, 7 and 8 offer various solutions, which have been practiced.

"Nerve center", i.e. air conditioning, refrigeration and electrical power distribution apparatuses, could be centrally located, usually out of the way in a penthouse.

This "spider web" design results in shorter ductwork, piping, cables, etc., provides for certain combinations and interchangeability of apparatus and assists maintenance and supervision.

The building shape will be a near square, which will lower its initial cost.

The disadvantages are:

The production lines on the inside of the "U" lack room for future expansion.

Right angle turns, i.e. conveyors, turn tables, etc., are required.

All inside areas must be properly ventilated. However, any single floor building calls for a greater or lesser number and capacities of air systems.

3. Circular line, single or several concentric lines, shown on Fig. 9 and 10 with common shipping and receiving, imply in reality that all operations start and terminate in close vicinity of each other. Receiving and shipping could be combined. In a small plant this feature has merit.

Single circular line is very popular in Europe, and is frequently called carousel. In the center there is placed the spider, comprising all services (water, electrical power, steam, etc.) with short webs radiating directly out to the working periphery.

Storages of materials are also placed adjacent to the areas where they are required, which reduces the materials handling.

All principal advantages and disadvantages of a "U" flow are retained.

However, the circular arrangements are suitable only for manufacturing of a single, or reasonably similar, product.

In eastern Europe there is a multi-floor bakery on each floor of which the products move in a circle and then are transferred down to the next floor. The value of the gravity flow is offset by the elevators and heavy building structure.

If feasible and practicable, the benefits of the gravity are derived from the work previously done by the elevator, pump or some other lifting device, power driven. Free gravity flow does not exist, except the water elevated by nature and used in hydro-electric plants.

4. Angular flow, which could be a right angle, "Z" or "T" shaped and any other combination. "L" shaped flow is shown on Fig. 11 and 12. Separate packing materials storage is placed adjacent to the finishing (packaging) operations in Fig. 12.

Whatever may be the good and sufficient reasons for selecting one or another pattern of flow, the fact remains that this job must be assiduously done and not left exposed to the fumbling methods of evolution.

"Error is preferred to chaos" says an old adage. The foregoing holds true in the case of single floor factories.

*Continued in our next issue*





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Simplex Steam Vacuum Cooker.  
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For Sale: 1 late-type Werner large size Automatic Ball Machine complete with Starlight and Ball rollers. First-class condition, used sparingly (item discontinued). 1 Latini Die Pop Machine. Box 481 % The MANUFACTURING CONFECTIONER.

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SITUATION WANTED - Industrial Engineer, 35, wide experience in Machine design, plant layout processing machinery, estimating cost of installation and production. Desire to work with good chemist as promotion engineer in candy Factory. Residence in Canada at present time, write Box 582 The MANUFACTURING CONFECTIONER.

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